EFFECTS OF KINESIO TAPING, MYOFASCIAL RELEASE AND CONVENTIONAL THERAPY ON PAIN AND UPPER EXTRIMITY FUNCTIONAL INDEX IN MYOFASCIAL PAIN SYNDROME ON UPPER TRAPEZIUS

- A COMPARATIVE STUDY

Dissertation submitted to the Tamil Nadu Dr. M.G.R. Medical University towards partial fulfillment of the requirements of **MASTER OF PHYSIOTHERAPY(Advanced PT in Orthopaedics)** degree programme.

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(A unit of Kovai Medical Center Research and Educational Trust)

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CERTIFICATE

This is to certify that research work entitled **"EFFECTS OF KINESIO TAPING, MYOFASCIAL RELEASE AND CONVENTIONAL THERAPY ON PAIN AND UPPER EXTRIMITY FUNCTIONAL INDEX IN MYOFASCIAL PAIN SYNDROME ON UPPER TRAPEZIUS"** was carried out by the candidate bearing the **Register No: 271410083**, KMCH College of Physiotherapy towards partial fulfillment of the requirements of the **Master of Physiotherapy (Advanced PT in Orthopaedics)** of The Tamil Nadu Dr. M.G.R. Medical University, Chennai-32.

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ABSTRACT

OBJECTIVES

To compare the effeectiveness of kinesio taping technique, myofascial release technique in decreasing pain, improving upper trapezius flexibility and improving the range of motion in subjects with myofascial pain syndrome.

STUDY DESIGN

Quasi experimental study design

STUDY SETTING

Kovai medical centre and hospital- Coimbatore

SAMPLE SIZE&INTERVENTION

30 Patients with myofascial pain syndrome who met the inclusion criteria were selected;

EXPERIMENTAL A : 10 individuals received kinesio taping technique

EXPERIMENTAL B : 10 individuals received myofascial release technique

CONTROL GROUP C : 10 individuals received conventional technique.

METHODOLOGY & PROCEDURE

Quasi-experimental research design with purposive sampling technique was employed. The study was carried out in Kovai Medical Center & Research Hospital, Coimbatore for duration of 4 weeks. Thirty patients diagnosed with Myofascial pain syndrome between age group 18 – 40 years, both male & females were selected. Thirty randomly allocated into 3 groups - A & B & C of 10 samples each. Group A received kinesio tape whereas Group B received myofascial release where as Group C received exercises to be followed at home in presence of a family member.

OUTCOME MEASURE

- Pain Status
- Upper extrimity questionnaire

MEASUREMENT TOOLS

- Visual analogue scale
- Upper extrimity functional index

RESULTS & CONCLUSION

The data were analyzed using paired ‘t’ tests and one way ANOVA at 5% level of significance.The results of this study concluded that kinesio taping technique is better than myofascial release technique in improving the pain and improving upper trapezius flexibility. But both techniques are effective in pain.

KEY WORDS

Kinesio tape technique, Myofascial release technique, Visual analouge scale, Upper extrimity functional index questionnaire.

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APPENDIX – 1

CONSENT FORM

I ---------- voluntarily consent to participate in the research study. “EFFECT OF KINESIO TAPING, MYOFASCIAL RELEASE AND CONVENTIONAL THERAPY ON SHOULDER RANGE OF MOTION AND FUNCTIONAL ABILITY IN MYOFASCIAL PAIN SYNDROME ON UPPER TRAPEZIUS”

The researcher has explained me the treatment approach in brief, the risk of participation and has answered the question related to the research to my satisfaction.

Signature of participant Signature of the researcher

Signature of the witness

Place:

Date:

APPENDIX - II

ASSESSMENT FORM

SUBJECTIVE EXAMINATION :

Name :

Age :

Sex :

Address :

Occupation :

Taut bands :

Nodules :

Recognition :

Local twitch response :

Pain in passive ROM :

Pain in trapezius contraction :

Allergy to tape :

Infection :

Hypermobility :

Medical condition : _____

Recent Surgery : _____

History of Fracture : _____

OBJECTIVE EXAMINATION:-

On Observation :

		PRE	POST
PAIN			
SITE			
VAS	On Activity	|----------|	
	At Rest	|----------|	

GONIOMETER

RANGE OF MOTION	ACTIVE		PASSIVE	
SHOULDER	LEFT	RIGHT	LEFT	RIGHT
FLEXION				
ABDUCTION				

MEASUREMENT TOOL

		PRE TEST		POST TEST	
VISUAL ANALOG SCALE					
ROM	FLEXION	LEFT	RIGHT	LEFT	RIGHT
	ABDUCTION				
UPPER EXTRIMITY FUNCTIONAL INDEX					

CERVICAL	**ACTIVE**		**PASSIVE**	
FLEXION				
EXTENSION				
SIDE FLEXION				
SIDE ROTATION				

APPENDIX – III

ACTIVATION AND PERPETUTAION OF TRIGGER POINTS

The normal antigravity function of upper trapezius is over stressed by any position or activity in which the muscle helps to carry the weight on the arm for a prolonged period.

SYMPTOMS

TrP1- When TrP1 is active, the patient usually has severe postrolateral neck pain that often is constant and usually associated with temporal headache on the same side and occasionally angle of jaw.

TrP- TrP2 causes severe neck pain, but usually without headache. Pain on motion, due to upper trapezius trigger point alone, occurs only when the head and neck are almost fully rotated actively to the opposite side, which contracts the muscle in an opposite side, which contracts th muscle in a shortened position.

TRAPEZIUS MUSCLE

Upper fiber's trigger point reffered pain arises as often from trigger point in upper trapezius as in any other muscle of the body. Central trigger point in the upper trapezius is the most frequently identified myofascial trigger point in the body.

Trigger point in the upper trapezius fibers characteristically reffer pain anf tenderness on the postero lateral aspect of the neck, and behind.

UPPER TRAPEZIUS FIBERS

TrP1- This central trigger point can be found the mid portion of the anterior border of the upper trapezius and involves most vertical fibers.

TrP2- Location is caudal and slightly lateral to trigger point (TrP1). Trigger point 2 is located in the middle, of the more near horizontal fibers of the upper trapezius.

APPENDIX - IV

10.2 VISUAL ANALOGUE SCALE

0 _____10

NO WORST

PAIN PAIN

Directions: Ask the patient to indicate on the line where the pain is in relation to the two

extremes. Measure from the left hand side to the mark.

APPENDIX V

THE UPPER EXTREMITY FUNCTIONAL INDEX (UEFI)

We are interested in knowing whether you are having any difficulty at all with the activities listed below because of your upper limb problem for which you are currently seeking attention. Please provide an answer for **each** activity.

Today, do you or would you have any difficulty at all with:

(Circle one number on each line)

	Activities	Extreme Difficulty or Unable to Perform Activity	Quite a Bit of Difficulty	Moderate Difficulty	A Little Bit of Difficulty	No Difficulty
1	Any of your usual work, housework, or school activities	0	1	2	3	4
2	Your usual hobbies, re creational or sporting activities	0	1	2	3	4
3	Lifting a bag of groceries to waist level	0	1	2	3	4
4	Lifting a bag of groceries above your head	0	1	2	3	4
5	Grooming your hair	0	1	2	3	4
6	Pushing up on your hands (eg from bathtub or chair)	0	1	2	3	4
7	Preparing food (eg peeling, cutting)	0	1	2	3	4
8	Driving	0	1	2	3	4
9	Vacuuming, sweeping or raking	0	1	2	3	4
10	Dressing	0	1	2	3	4
11	Doing up buttons	0	1	2	3	4
12	Using tools or appliances	0	1	2	3	4
13	Opening doors	0	1	2	3	4
14	Cleaning	0	1	2	3	4
15	Tying or lacing shoes	0	1	2	3	4
16	Sleeping	0	1	2	3	4
17	Laundering clothes (eg washing, ironing, folding)	0	1	2	3	4
18	Opening a jar	0	1	2	3	4
19	Throwing a ball	0	1	2	3	4
20	Carrying a small suitcase with your affected limb	0	1	2	3	4
	Column Totals:					

Minimum Level of Detectable Change (90% Confidence): 9 points **SCORE: ____/80**

Source: Stratford PW, Binkley, JM, Stratford DM (2001): Development and initial validation of the upper extremity functional index. Physiotherapy Canada. 53(4):259-267.

1. INTRODUCTION

The sensory motor and automatic symptoms are caused by myofascial trigger points. The muscle group or specific muscle that causes the symptoms should be identified. A regional pain syndrome can be of any soft tissue origin. To avoid confusion, we recommend that when anyone uses the term myofascial pain syndrome, that person should specify which meaning applies the general or specific definition.

Myofascial Pain Syndrome have a very high prevalence in the general population and also 30% of people who seek consultation for pain have been shown to have Myofascial Pain Syndrome. Myofascial Pain Syndrome has been shown to affect the functional ability of the patient.

Myofascial Pain Syndrome is most common in the neck muscles and trapezius is the most commonly affected muscle. If has been found that a central trigger point in the upper trapezius is the most frequently identified trigger point (myofascial) location in the body.

The shoulder mobility depends both on the glenohumeral and scapular movements. So any decrease in the scapular movements will in turn affect shoulder mobility. The scapular movements are influenced by the muscles affected to it especially the trapezius, rhomboidus and serratus anterior.

In the trapezius myofascial trigger point is present it can alter the scapular kinematics and result is scapular dysfunction. And hence decreased shoulder mobility.

For the treatment of Myofascial Pain Syndrome various non-invasive techniques have been suggested for. These include stretch and spray, spray, cryotherapy, Transcutaneous electrical nerve stimulation , Ultrasound, muscle strengthening, massage, kinesio Taping, dry needling and Myofascial release.

Taping therapy is a natural therapy in which adhesive tapes without any chemical treatment are attached to muscle in the body. It utilizes the principle cramp and muscle tone etc. and improves blood, tissue fluid and lymph circulation. So that

the muscles that could not be harmonized with their surroundings can achieve balance, thus symptoms can be relieved and pain can be controlled.

Kinesio Tape (KT) is a treatment method theorized to improve joint ROM on the neck and lumbar spine. Kinesio Tape is believed to have therapeutic effects that promote edema reduction, pain control.Elasticity of kinesio tape increase range of motion and blood and lymphatic flow with in underlying tissue . Kinesio Tape is theorized by lifting the skin over the targeted treatment area which increase interstitial space, which is the mechanism believed treatment area, which is the mechanism believed to decrease pain, increase blood and lymphatic circulation and increase joint mobility.

Myofascial release is a soft tissue mobilization technique, defined as the facilitation of mechanical, psycho physiological and neural adaptive potential as interfaced via the myofascial system. By Myofascial Relase there is a change in the viscosity of the ground substance to a more fluid state which eliminates the fascia's excessive pressure on the pain sensitive structure and restores proper alignment. This technique acts as a catalyst in the reduction of trapezius spasm.

1.1 NEED FOR THE STUDY

Myofascial Pain Syndrome is highly prevalent and trapezius is the most common affected muscle. The problem in trapezius muscle can result in scapular dysfunction which in turn can affect the shoulder Range of motion.

Evidence shows that myofascial release and kinesio taping individually and independence are proven to be effective technique to improve shoulder mobility (Range of motion of shoulder joint) and reduce pain in several muscular skeletal conditions when applied at trapezius muscle.

But till data these sustain only view few studying which compare the effectiveness of Kinesio Tape and Myofascial Relase. Hence there is a need to study this relation.

1.2. AIMS AND OBJECTIVES

1.2.1 Aim

The aim of the study is to find the effects of Kinesio Taping, Myofascial Release and Conventional therapy on pain and upper extrimity functional index in myofascial pain syndrome on upper trapezius.

1.2.2 Objectives

To investigate the effect of kinesio tapping on pain reduction, increase in shoulder ROM and improvement in upper extremity functional abilities in post myofascial pain syndrome patient.

To investigate the effect of myofascial release on pain reduction, increase in shoulder ROM and improvement in upper extremity functional abilities in post myofascial pain syndrome patient.

To compare the effectiveness of kinesio taping along with myofascial release with either of kinesio taping only or myofascial release only

2. REVIEW OF LITERATURE

2.1 MYOFASCIAL PAIN SYNDROME

PREVALENCE OF MYOFASCIAL PAIN IN GENERAL INTERNAL MEDICINE PRACTICE[6]

(SKOOTSKY SA et al :- PREVELANCE OF MYOFASCIAL PAIN IN GENERAL INTERNAL MEDICINE PRACTICE, WEST J MED 1989 AUG, 151:157-160)

In this study, author suggested that the prevalence severity and duration of myofascial pain syndromes may be an important cause of regional pain complaints in patients seeking primary care from internists.

Myofascial pain was a pain syndrome characterized among patient as a trigger point in a taut band of skeletal muscle and is often associated with referred pain as well. In this study, a series of 172 patients presenting to university primary care general internal medicine practice were exam. Out of which, 54 patients to hospital were found to have a subjective complain of pain alone. Only 16(30%) satisfied the inclusion criteria for a clinical diagnosis of myofascial pain.

Intensity of pain was measured using visual analouge scale. It was found that the pain experienced due to myofascial pain syndrome was much higher compared with other reason of pain. Hence, the author concluded saying pain due to myofascial pain syndrome to be the most common reason for the study participants to visit their respective physician.

EFFICACY OF 904NM GALLIUM ARSENIDE LOW LEVEL LASER THERAPY IN THE MANAGEMENT OF CHRONIC MYOFASCIAL PAIN IN THE NECK: A DOUBLE BLIND AND RANDOMIZE CONTROLLED TRIAL[4]

(ALI GUR, et al LASER IN SURGERY AND MEDICINE 35:229-235 (2004))

A study was conducted to evaluate the efficacy of infrared low level 904NM Oxallium Arsenide Laser Therapy on patients with chronic myofascial pain in the neck.

The author tried to see its on clinical and quality of life participants. 60 participants was chossen for the study were divided in 2 group with 30 in each. Group: 1 received actual laser while group:2 got placebo laser. This therapy was continued with 2 weeks except weekened.

A follow up was done at baseline 2, 3 and 12 weeks. Participants were evaluate with respect to pain at rest, pain at movement. No of trigger points, neck pain and disability visual analouge scale. Beck depression inventary and Nottingham Health Profile.

Results showed a significant improved in all outcome measures in active laser group. Hence, it was concluded that application of laser therapy. It effective in pain relief and improvement in quality of life among patients with myofascial pain syndrome.

CLASSIFICATION, EPIDEMIOLOGY AND NATURAL HISTORY OF MYOFASCIAL PAIN SYNDROME [17]

(ROBERT D. GERWIN, CURRENT PAIN AND HEADACHE REPORTS 2001)

Myofascial pain syndrome was a disease of muscle that produces local and reffered pain. It characterized by motor abnormality and sensory abnormality. It can be acute or chronic, regional or generalised, if myofascial pain syndrome become

chronic it tends to generalise however doesnot become fibromyelgia. The site of pain was characterised by myofascial trigger point. The physical and motor sign of trigger point is a taut band. The sensory manifestation of trigger point was tenderness it could be a hypersensitive response or a painful response to a non painful stimulus as well.

Primary myofascial pain syndrome usually occurs with out any other medical illness, include myogenic headache, neck pain, shoulder pain, frozen shoulder, low back pain etc. However secondary myofascial pain syndrome occurs as a result of process or illness, includes 2 degree frozen shoulder, radicular pain, fibromyelegia, rheumatic arthritis etc.

2.2 MYOFASCIAL TRIGGER POINT

THE EFFECTS OF PRESSURE RELEASE, PHONOPHOROSIS OF HYDROCORTISONE AND ULTRASOUND ON UPPER TRAPEZIUS LATENT MYOFASCIAL TRIGGER POINT[7]

(JAVAD SARRAFZADEH et al ARCH PHYS MED REHABIL VOL 93, JANUARY 2012;93:72-7)

Myofascial Trigger Point was a hyperirritable nodule of spot tenderness in a palpable taut band of skeletal muscle that can refer pain to a distant point and also cause as distant motor and autonomic effect. It is classified as latent and active. There are many invasive and noninvasive technique for myofascial trigger point. However this study aimed that comparing the effects of pressure release, phonophorosis of hydrocortisone and ultrasonic therapy in patients with hand, upper trapezius latent myofascial trigger point.

60 participants were selected for the same and divided into 4 groups. Each group had 15 subjects and 3 groups receive pressure release, phonophorosis of hydrocortisone and ultrasonic therapy and control. And the therapy lastet for 6 sessions.

The investigators concluded same, all 3 treatments were effective for treating myofascial trigger point. However, phonophorosis of hydrocortisone suggested as a new method which was found to be more effective.

INTERRATER RELIABILITY IN MYOFASCIAL TRIGGER POINT EXAMINATION[9]

(ROBERT D. GERWIN et al INTERNATIONAL ASSOCIATION FOR THE STUDY OF PAIN. PUBLISHED BY ELSEVIER SCIENCE IRELAND 13 AUG 1996)

Myofascial trigger point includes several clinical features likes point tenderness and taut muscle bend local twitch response, reffered pain, reproduction of usual pain, restricted range of motion weakness without atrophy autonomic symptoms. These features are essential for diagnosis and subsequent treatment of myofascial pain syndrome. However it was very difficult to identify the same by palpation in the physical examination of muscle. And there was lack of interrater reliability i.e, greemen between 2 and more examiners in this condition. Hence this study aimed at establishing and interrater reliability in myofascial trigger point following in intensive trainning helped in successfully establishing and interater reliability in the diagnosis of myofascial trigger point. Also the study result shows the local twich response to be most difficult clinical feature in establishing the reliability.

MUSCLE ACTIVATION PATTERNS IN THE SCAPULAR POSITIONING MUSCLES DURING LOADED SCAPULAR PLANE ELEVATION: THE EFFECTS OF LATENT MYOFASCIAL TRIGGER POINTS[15]

(KAREN R. LUCAS et al, ELSEVIER PUBLISHED 17 MAY 2010)

In this study the author wanted to observe the muscle activation patterns loaded state in upward scapular rotator muscle. In case of latent myofascial trigger point. The examination was done to understand the effects of these lessons on the performance of shoulder abduction.

This study employed use of surface electromyography to measure the timing of onset of muscle activation. The comparision were made between 2 group, 1 control group with out any latent trigger point (n= 14) and another latent trigger point group

(n=28). The control group displayed a relability of sequence of muscle activation suggesting in consistent pattern of muscle activation in the presence of latent trigger point in upward scapular rotators.

2.3 KINESIO TAPE

THE EFFECT OF STABILIZATION EXERCISES COMBINED WITH TAPING THERAPY ON PAIN AND FUNCTION OF PATIENTS WITH MYOFASCIAL PAIN SYNDROME[1]

(JUNG HO LEE et al J. PHYS THER SCI 24:1283-1287, 2012)

There are many alternatives for treating myofascial pain syndrome. One of them as taping therapy. It was a natural therapy in which adhesive tape are used with out any chemical treatment attached to muscle in the body. It emploies a principle called contency of muscle to normalize reduce muscle strength cramp and muscle tone. Also it improves blood circulation, tissue fluid and lymphatic circulation. Hence this study aimed that comparing effects of stabilization exercise with taping therapy to upper trapezius muscle on patients with myofascial pain syndrome.

In this study employed 32 myofascial pain syndrome patients divided into 2 groups with 16 participants each 1 group received stabilization exercise were as the other receive taping therapy. Afollow up was done after a period of 4 weeks. The result showed greater improvement and substantion pain relief in the taping therapy group with out any complains of adverse effect during or often the sessions.

THE EFFECTS OF KINESIO TAPE AND STRETCHING ON SHOULDER ROM[2]

(AI UJINO ET AL international journal of athletic therapy and trainning 24 march 2013)

This study was conducted to investigate the efficacy kinesio tape application on increaseing shoulder range of motion. KT technique was used to alter scapular position in a manner that would increase glenohumeral range of motion.

It was a comparative study conducted on 142 patients myofascial pain syndrome and taping. Out of which, 71 patients of each where allocated to experimental group and control group as well.

The result suggested that KT can increases shoulder ROM. Stretching was not found to have an effect on shoulder ROM, regardless of whether it was used alone or combination with kinesio tape.

ARE SOFT TISSUE THERAPIES AND KINESIO TAPING USEFUL FOR SYMPTOM MANAGEMENT IN PALLIATIVE CARE? THREE CASE REPORTS[11]

(ANNA PYSZORA ET AL adv pall med 2010;9,3:87-92)

Pallitave care focuses on physical, psychological and spiritual care of patient with progressive diseases such as cancer. It aims at providing the best quality of life for the patient and the palliative care. Patient with pallitave care have a high prevelance of weakness, pain, fatigue,constipation and other unpleasant symptoms. Hence, physiotherapy has considered one of the important domain of care provided to these patient to improve the quality of life. And this study author have included 3 case report, were in patient were treated with various method of physiotherapy such as Kinesio Taping and soft tissue therapy to relief pain. It was found that physiotherapy can minimize the complication and effects of disease and optimize patient condition

THE CLINICAL EFFICACY OF KINESIO TAPE FOR SHOULDER PAIN: A RANDOMIZED DOUBLE-BLINDED, CLINICAL TRIAL[22]

(MARK D. THELEN et al JOSPT , VOL- 38, NUMBER-7, JULY 2008)

This study was done to establish the clinical efficacy of kinesio tape for shoulder pain. Randomized double blinded control trial was used as a study design with equal number of participants in the control and experimental group. Result suggests that kinesio tape may be some assistance in improving painfree active range of motion around shoulder. However the effect was found immediately after tape

application for patient shoulder pain. Hence the authour emphasizes on use of kinesio tape for reducing pain intensity.

2.4 MYOFASCIAL RELEASE

COMPARATIVE STUDY OF MYOFASCIAL RELEASE AND COLD PACK IN UPPER TRAPEZIUS SPASM[8]

(EKTA S. CHOUDHARY et al INTERNATIONAL JOURNAL OF HEALTH SCIENCES AND RESEARCH VOL.3: ISSUE 12: DECEMBER 2013)

Neck pain commonly seen in back of neck and between the bases of neck to shoulder mainly indicates the involvement of upper trapezius muscle.

In this study authour suggested that MFR shows greater effectiveness as compared with cold pack and exercises in treatment of upper trapezius spasm.

Authour conducted a comparative study was conducted of MFR and cryotherapy. 45 patients of upper trapezius spasm allocated in each experimental group and the control group. After 5 days follow up patients of experimental group showed greater improvement and no adverse events occurred during or after the session.

MYOFASCIAL RELEASE[10]

(SALVI SHAH et al INTERNATIONAL JOURNAL OF HEALTH SCIENCES AND RESEARCH VOL.2: ISSUE:2, MAY 2012)

In this study author sustained stretch gradually, over times this allow the myofascial tissue to elongate and relax. Thus it helps in increasing range of motion, flexibility in decreasing pain, conducted that myofascial release was a very effective, gentle and safe hands on method of soft tissue mobilization. It incorporates gentle pressure to the subcutaneous and myofascial connective tissue. Myofascial release was used to release is to fascia restriction and restore its tissue extrimities Gentle and sustained stretching of myofascial release was believed to break adhesions and softens

and lengths the fascia. This further result is releasing pressure over comprened blood vessels due to adhesive. Thus, improving circulation of transmission of impulse.

2.5 VISUAL ANALOG SCALE

1-RELIABILITY OF THE VISUAL ANALOG SCALE FOR MEASUREMENT OF ACUTE PAIN[31]

(POLLY E. et al ACADEMIC EMERGENCY MEDICINE. DEC 2001, VOL 8, NUMBER 12)

Visual Analoug Scale was generally regarded as a valid and reliable tool for chronic pain measurement. In this study authour suggested that reliability of the Visual analoug scale for acute pain measurement as asessed by the Intraclass correlation coefficent (ICC) appears to be high. 90% of the pain ratings were reproductible within 9mm. These data suggest that the Visual analog scale was sufficiently reliable to be used to assess acute pain.

It appears to be equally valid in acute pain measurement to the best of our knowledge, its reliability has not been assessed in this setting. However its reliability as a tool for measuring acute pain was not establishing hence in this study the authour aimed at establishing its reliability for acute pain. The assessment was done by Intraclass correlation coefficent (ICC) with appears to be high 90% of pain retings reproducable with in 9 mm. Thus these data suggest that Visual Analouge Scale is sufficiently reliable in asseing acute pain.

VALIDITY OF FOUR PAIN INTENSITY RATING SCALES[12]

(MARIA ALEXANDRA FERREIRA VALENTE et al INTERNATIONAL ASSOCIATION FOR THE STUDY OF PAIN, PUBLISHED BY ELSEVIER 11 JULY 2011)

Visual Analogue Scale (VAS), Numerical Rating Scale (NRS), Verbal Rating Scale (VRS), and the Faces Pain Scale – Revised (FPS-R) more common measures of in tensity of pain.It was used popularly both in clinical area and research field. There are many researchers have established the validity of these 4 measures in an extenser

manner. However there are very few studies which have compared to the critical validity criteria of responsibility. Hence, the current study aimed that establishing the relative validity of these measures for detecting differences in pain stimulus intensity. Also it focuses on establishing the gender differences in response to experimental induced pain. Result showed statistical significant differences in pain intensity between temporary for each scale, lower temperature resulting in higher pain intensity. The order of responsibility was Visual Analogue Scale (VAS), Numerical Rating Scale (NRS), Verbal Rating Scale (VRS), and the Faces Pain Scale – Revised (FPS-R) . However the responsibility between scale was very small. Few of the scales also able to capture the sex difference in pain intensity. However most responser was NRS.

MEASURING CHANGE WITH MULTIPLE VISUAL ANALOG SCALES: APPLICATION TO TENSE AROUSAL[27]

(STEPHANE VAUTIER, EUROPEAN JOURNAL OF PSYCHOLOGICAL ASSESSMENT, HOGREFE 16 MARCH 2013)

In this study authour reports evidence for transient phenomena equivalence of change scores associated with VAS designed for assessing tense arousal with synonymous indicators.

Authour suggest that VAS associated with synonymous indicators may yield highly reliable measurement variables.

RELIABILITY, VALIDITY AND SENSITIVITY OF A COMPUTERIZED VISUAL ANALOG SCALE MEASURING STATE ANXIETY[28]

(RANY ABEND et al, ELSEVIER PUBLISHED 18 JUNE 2014)

Measuring scale anxiety has always being a challenge for researchers and clinicians. It is important as well to know about the transient and subjective psychological state of patient. Hence, assessment of state anxiety was friquently required in clinical and research settings but it considers equally practically

challanging as well. Hence the authour focuses on use of single item VAS for measuring state anxiety which allows rapid assessment of current anxiety state. And investigator have concluded same the adequate psychometric properties combiened with simple and rapid administration makes the computerized VAS a valuable self tratable tool for state anxiety.

2.6 UPPER EXTREMITY FUNCTIONAL INDEX

RELIABILITY AND VALIDITY OF TWO VERSIONS OF THE UPPER EXTREMITY FUNCTIONAL INDEX[29]

(BERT M. CHESWORTH et al PHYSIOTHERAPY CANADA 2014, 66(3); 243-253, DOI:10.3138/PTC.2013-45)

In this study authour suggested THE Upper Extrimity Functional Index - 20 and the Upper Extrimity Functional Index-15 have comparable reliability and validity. Both Upper Extrimity Functional Index-15 is recommended because it measures only one dimension.

3. MATERIALS AND METHODOLOGY

3.1 RESEARCH DESIGN

Quasi experimental study design

3.2 SAMPLING TECHNIQUE

Purposive sampling

3.3 STUDY POPULATION

Individual with unilateral upper trapezius trigger point

3.4 SAMPLE SIZE

\Total-30

Experimental group: -

Group- A: - 10 (KINESIO TAPING TECHNIQUE)

Group- B: - 10 (MYOFASCIAL RELEASE)

Control group: -

Group- C: - 10

3.5 STUDY DURATION

1 Year

3.6 STUDY SETTING

Department of Physiotherapy, KMCH Coimbatore

3.7 STUDY CRITERIA

3.7.1 INCLUSION CRITERIA

- Age :- 18 -40 years
- Gender:- Both male and females
- Patient with unilateral trigger point on upper trapezius
- Patient with single trigger point
- Taut palpable band.
- A nodule in a taut palpable band of upper trapezius muscle.

- Recognition: - Application of digital pressure trigger point can elicit a referred pain pattern characteristic of trapezius muscle (Unilaterally upward along the posterolateral aspect of the neck to mastoid process.
- Local twitch response: - Snapping palpation of TrP frequently evokes a transient twitch response of the taut band fibers.
- Passive stretch to muscle cause pain and ROM restricted (Reduce lateral side flexion and same side rotation)
- Painful contraction:- weakness of trapezius muscle
- UEFI – Score between 40 to 65 .

3.7.2 EXCLUSION CRITERIA

- Previous surgery that could have affected the trapezius muscle.
- Severe trauma, possibilityof fracture and soft tissue injury around shoulder and neck region.
- Cervical radiculopathy, brachial plexopathy,other nerve impingment
- Fever, regional skin infection, malignancy, TB, tumor, fibromyalgia and any shoulder fracture are contraindicated.
- Wide spread, general pain
- Widespread tenderness
- Muscle feels soft and doughty
- Hyper mobility
- Examine for tender point
- Delayed and poor response to infection of TrPs

3.8 HYPOTHESIS

NULL HYPOTHESIS

H_{01} - There is no significant effect of kinesio tapping on pain reduction and upper extrimity functional index scale on myofascial pain syndrome on upper trapezius.

H_{02} . There is no significant effect of myofascial release on pain reduction and upper extrimity functional index scale on myofascial pain syndrome on upper trapezius

H_{03} - There is no significant improvement by kinesio taping technique on questionnaire pain scores in patient with upper trapezius trigger point

H_{04} - There is no significant improvement by myofascial release technique on questionnaire pain scores in patient with upper trapezius trigger point

H_{05} - There will be no a significant difference in pain reduction and a between receiving myofascial release, kinesio taping and conventional group.

3.9 OUTCOME MEASURES

- Pain status
- Upper extremity questionnaire

3.10 MEASUREMENT TOOLS

- Visual analogue scale (VAS)
- Upper extremity functional index (UEFI)

3.11 PROCEDURE

- In experimental group – 1
    - Intervention program - Kinesio Taping
        - TECHNIQUE :-
            - Apply the tape fully stretched along its entire length
            - The ends of the tape are applied without stretching
            - Repeat for each strip of tape
            - Sequence :- Horizontal, Vertical, Diagonal
            - Complete taping with four strips of tape
            - Continue for five days. On the 6^{th} day it was removed and patient was given rest for 2 days
            - On the 8^{th} day again kinesio taping was applied for next 5 days, the above procedure was repeated for next week (4^{th})
            - Duration of intervention :- 4 weeks

- In experimental group – 2
    - Intervention program:- Myofascial release
        - TECHNIQUE:-
            - Land on the surface of the body with the appropriate "tool" (knuckles, or forearm etc)
            - Sink in to the soft tissue.
            - Contact the first barrier/restricted layer.
            - Put in a "line of tension".
            - Engage the fascia by taking up the slack in the tissues.
            - Finally move or drag the fascia across the surface while staying in touch with the underlying layers.
            - Exit gracefully.

- Rotate the patient's head laterally while maintaining stretch at the base of occiput and proximal to the shoulder to continuous unilateral focused stretch of upper trapezius.
- Hold, wait for the release and stretch again by pushing the patient's shoulder down and out at same time.
- Repeat the stretch sequence until a final end feel is reached.
- Don't push the patient's head into lateral flexion.

- In control group
    - Intervention program:- Conventional therapy
    - Duration of intervention:- 4 weeks
- In control group
    - Intervention program- Exercises
        - TECHNIQUE
            - STRETCHING:
                - Sitting in a chair with shoulder relaxed. Ask him to bring his chin down towards his right collar bone as for as he can without rounding his upper back
    - Then ask the patient to turn his head slightly to left

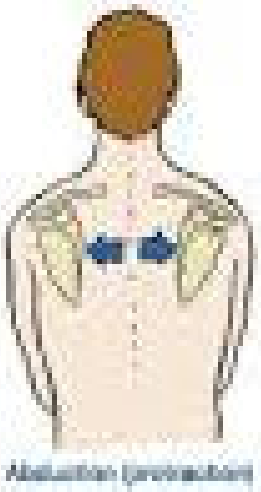
- He should feel a pulling sensation in left side of neck
- Hold the position for 20 seconds
- Repeat again twice in that side
- Stretching for right side of neck should be done in opposite direction

Stretch time: 20 seconds

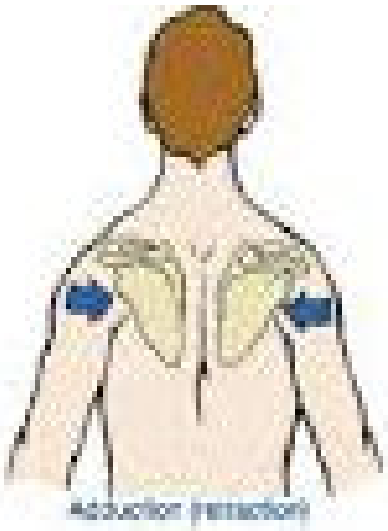
Repetition: once in a day

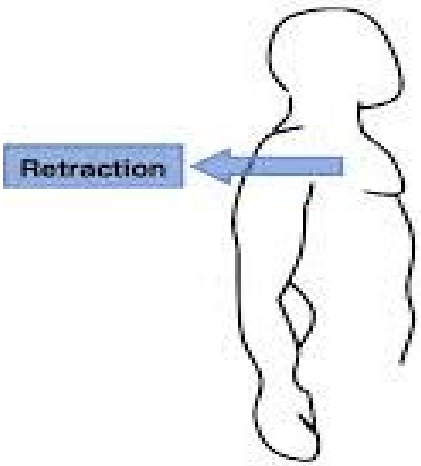
Duration : 4 weeks

- SHOULDER GIRDLE EXERCISES:
    - Scapular protraction

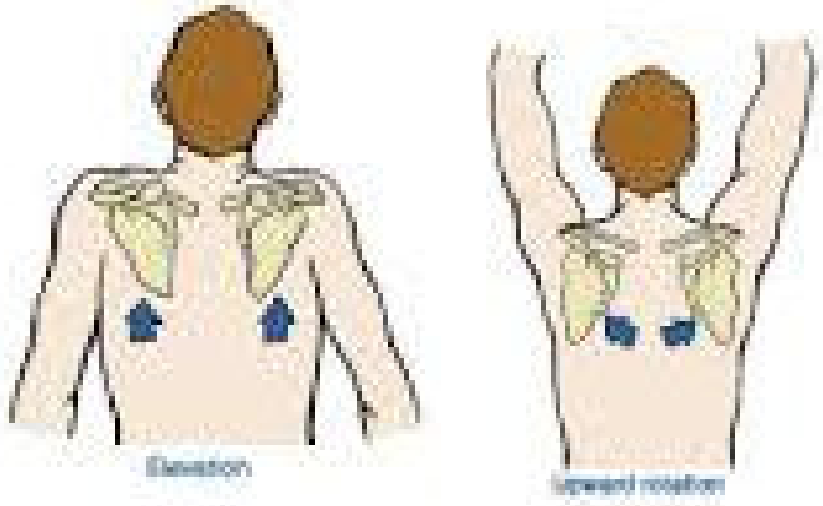


    - Scapular retraction

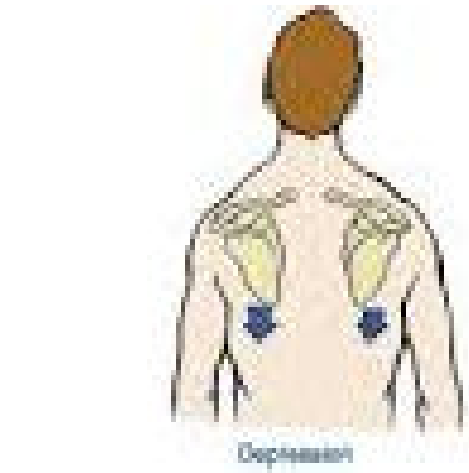


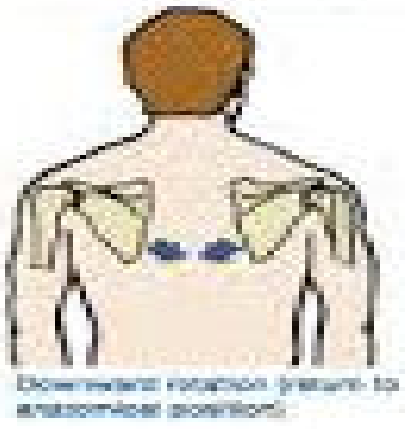


- Scapular elevation



- Scapular depression





- Cervical flexion

- Cervical extension

- Right and left rotations

- Right and left side flexions

All exercises are given for 10 repetitions and 5 sec holds.

3.12 PHOTOGRAPHIC REPRESENTATION

FIGURE 3.12.1 - KINESIO TAPPING

FIGURE 3.12.2 – KINESIO TAPPING

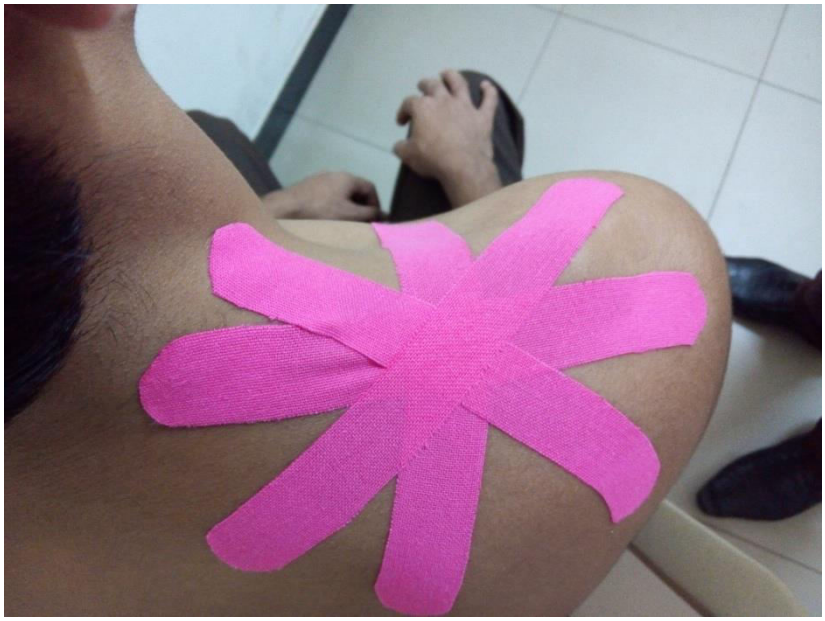


FIGURE 3.12.3 MYOFASCIAL RELEASE

FIGURE 3.12.4 MYOFASCIAL RELEASE

3.13 STATASTICAL ANALYSIS

PAIRED `t' TEST (within groups)

- Post-test values of the study will be collected and assessed for variation in each group and their results will be analyzed using paired 't'test.

$t = \frac{\bar{d}\sqrt{n}}{s}$ Where,

$$S = \sqrt{\frac{\sum d^2 - [\bar{d}]^2 \times n}{n-1}}$$

- **S** = Combined standard deviation
- **d_1 & d_2** = difference between initial and final readings in a experimental group A & group B
- **n_1 & n_2**= number of patients in a experimental group A & group B

2) ONE WAY ANOVA

SOURCE OF VARIATION	SQUARED VARIATION	DEGREE OF FREEDOM	MEAN SUM OF SQUARES	F RATIO
SUM OF SQUARES BETWEEN SAMPLE	SSC	C-1	MSC=SSC/C-1	F=MSC/MSE
SUM OF SQUARES WITHIN SAMPLE	SSE	N-C	MSE=SSE/N-C	

- SSC = $\sum (\overline{X1} - \overline{X1})^2 + \sum(\overline{X2} - \overline{X2})^2 + \sum(\overline{X3} - \overline{X3})^2$
- SSC = $\sum (X1 - \overline{X1})^2 + \sum(X2 - \overline{X2})^2 + \sum(X3 - \overline{X3})^2$
- C= number of sample
- N= Total number of items in all sample groups
- MSC=Calculation of mean sum of squares between sample
- MSE= calculation of mean sum of squares within sample.
- Level of significance is 5%

4. DATA PRESENTATION

4.1 TABULAR PRESENTATION

4.1.1 PAIRED T TEST

4.1.1 KINESIO TAPE GROUP

TABLE NO. 4.1.1.1 VISUAL ANALOUGE SCALE

OUT COME MEASURE	MEAN VALUE		CALCULATED 'T' VALUE	TABLE 'T' VALUE	LEVEL OF SIGNIFICANCE
	PRE TEST	POST TEST			
VISUAL ANALOUG SCALE	7	1.5	10.59	2.262	P<0.05 (SIGNIFICANT)

TABLE NO 4.1.1.2 UPPER EXTRIMITY FUNCTION INDEX

OUT COME MEASURE	MEAN VALUE		CALCULATED 'T' VALUE	TABLE 'T' VALUE	LEVEL OF SIGNIFICANCE
	PRE TEST	POST TEST			
VISUAL ANALOUG SCALE	54.3	70.7	31.59	2.262	P<0.05 (SIGNIFICANT)

4.1.2 MYOFASCIAL RELEASE GROUP

TABLE NO 4.1.2.1 VISUAL ANALOUGE SCALE

OUT COME MEASURE	MEAN VALUE		CALCULATED 'T' VALUE	TABLE 't' VALUE	LEVEL OF SIGNIFICANCE
	PRE TEST	POST TEST			
VISUAL ANALOUG SCALE	6	2.6	12.79	2.262	P<0.05 (SIGNIFICANT)

TABLE NO 4.1.2.2 UPPER EXTRIMITY FUNCTION INDEX

OUT COME MEASURE	MEAN VALUE		CALCULATED 'T' VALUE	TABLE 'T' VALUE	LEVEL OF SIGNIFICANCE
	PRE TEST	POST TEST			
VISUAL ANALOUG SCALE	52.9	68.4	4.34	2.262	P<0.05 (SIGNIFICANT)

4.1.3. CONVENTIONAL GROUP

TABLE NO 4.1.3.1 VISUAL ANALOGUE SCALE

OUT COME MEASURE	MEAN VALUE		CALCULATED 'T' VALUE	TABLE 'T' VALUE	LEVEL OF SIGNIFICANCE
	PRE TEST	POST TEST			
VISUAL ANALOUG SCALE	5.6	2.4	7.71	2.262	P<0.05 (SIGNIFICANT)

TABLE NO 4.1.3.2 UPPER EXTRIMITY FUNCTIONAL INDEX

OUT COME MEASURE	MEAN VALUE		CALCULATED 'T' VALUE	TABLE 'T' VALUE	LEVEL OF SIGNIFICANCE
	PRE TEST	POST TEST			
VISUAL ANALOUG SCALE	56.9	68.2	11.3	2.262	P<0.05 (SIGNIFICANT)

4.1.4. ONE WAY ANOVA

PRE TEST

4.1.4.1 VISUAL ANALOUGE SCALE

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	CALCULATED F VALUE	TABLE VALUE	LEVEL OF SIGNI-FICANCE
BETWEEN SAMPLES	10.4	2	5.2	2.18	3.35	0.05
WITH IN SAMPLES	64.4	27	2.38			

4.1.4.2 UPPER EXTRIMITY FUNCTIONAL INDEX

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	CALCULATED F VALUE	TABLE VALUE	LEVEL OF SIGNI-FICANCE
BETWEEN SAMPLES	82.4	2	41.2	1.06	3.35	0.05
WITH IN SAMPLES	1043.9	27	38.66			

4.1.5. ONE WAY ANOVA

POST TEST

4.1.5.1 VISUAL ANALOUGE SCALE

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	CALCULATED F VALUE	TABLE VALUE	LEVEL OF SIGNI-FICANCE
BETWEEN SAMPLES	6.87	2	3.43	4.39	3.35	0.05
WITH IN SAMPLES	21.3	27	0.78			

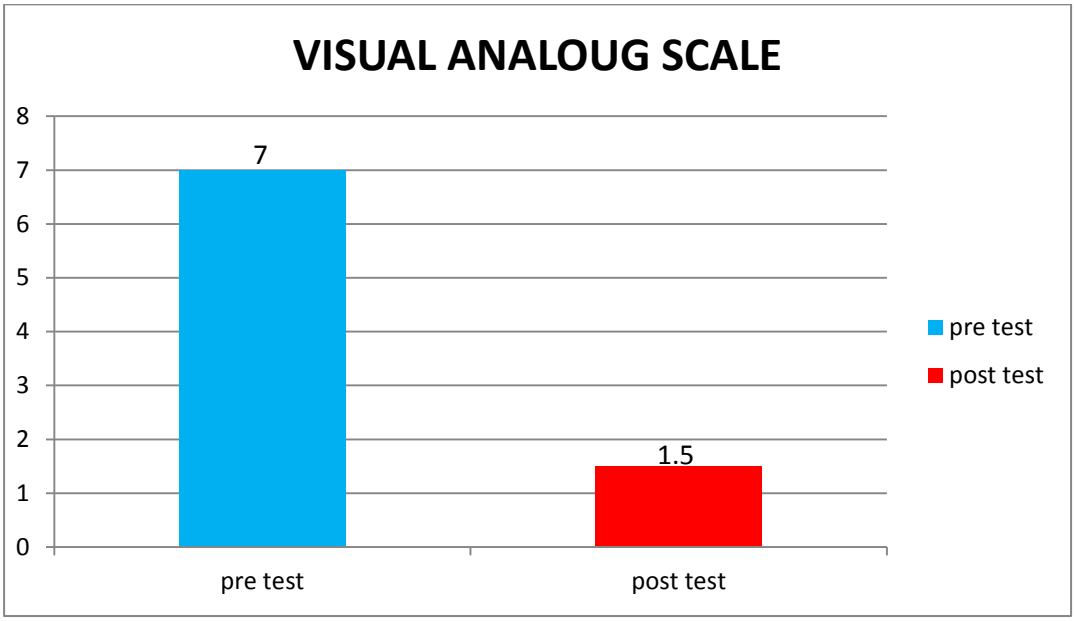
4.1.5.2 UPPER EXTRIMITY FUNCTIONAL INDEX

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	CALCULATED F VALUE	TABLE VALUE	LEVEL OF SIGNI-FICANCE
BETWEEN SAMPLES	38.6	2	19.3	19.37	3.35	0.05
WITH IN SAMPLES	26.909	27	0.996			

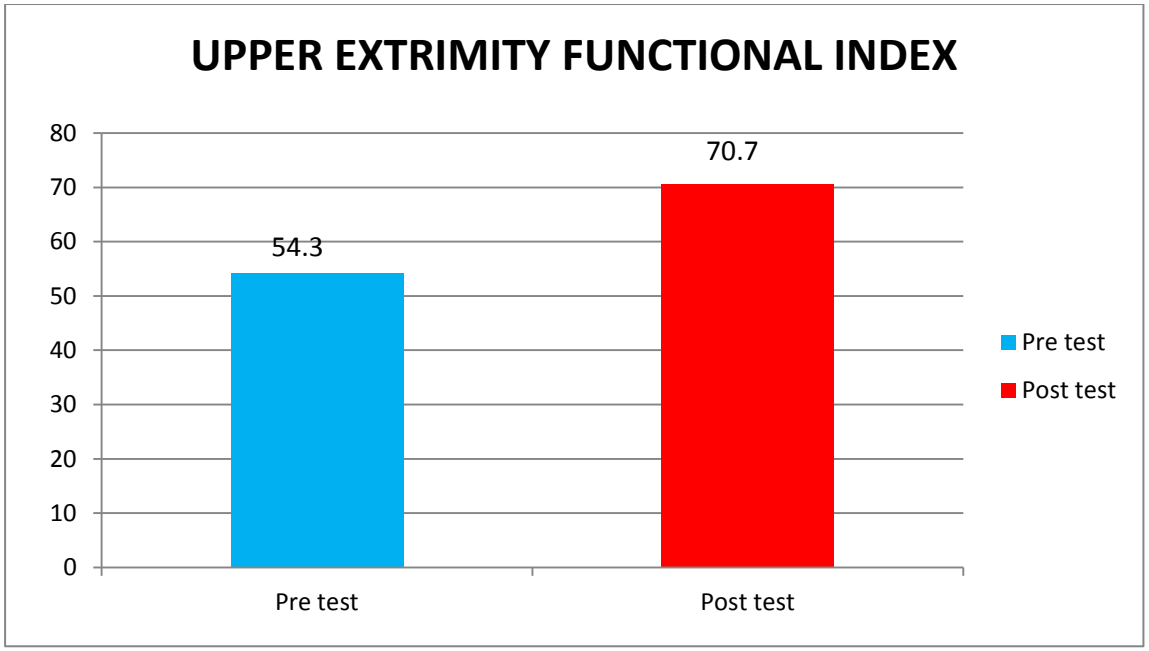
4.2 GRAPHICAL REPRESENTATION

4.2.1 PAIRED T TEST - KINESIO TAPE GROUP

4.2.1.1 VISUAL ANALOUG SCALE

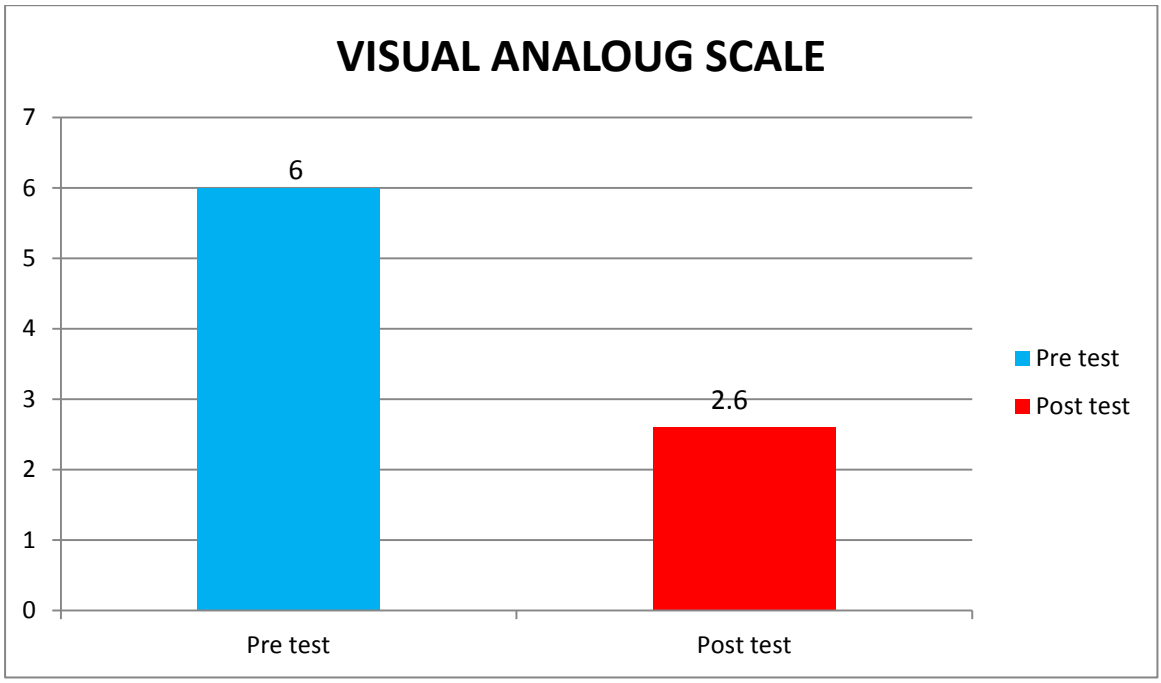


4.2.1.2 UPPER EXTRIMITY FUNCTIONAL INDEX QUESTIONNAIRE

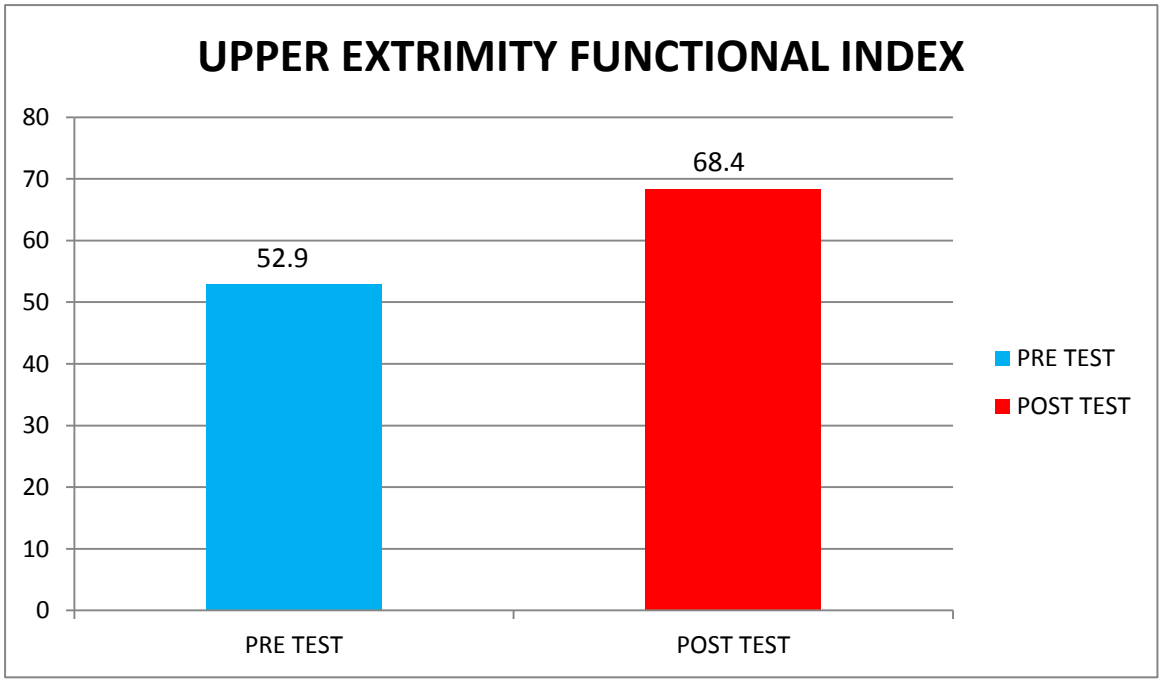


4.2.2 PAIRED 'T' TEST - MYOFASCIAL RELEASE GROUP

4.2.2.1 VISUAL ANALOUG SCALE

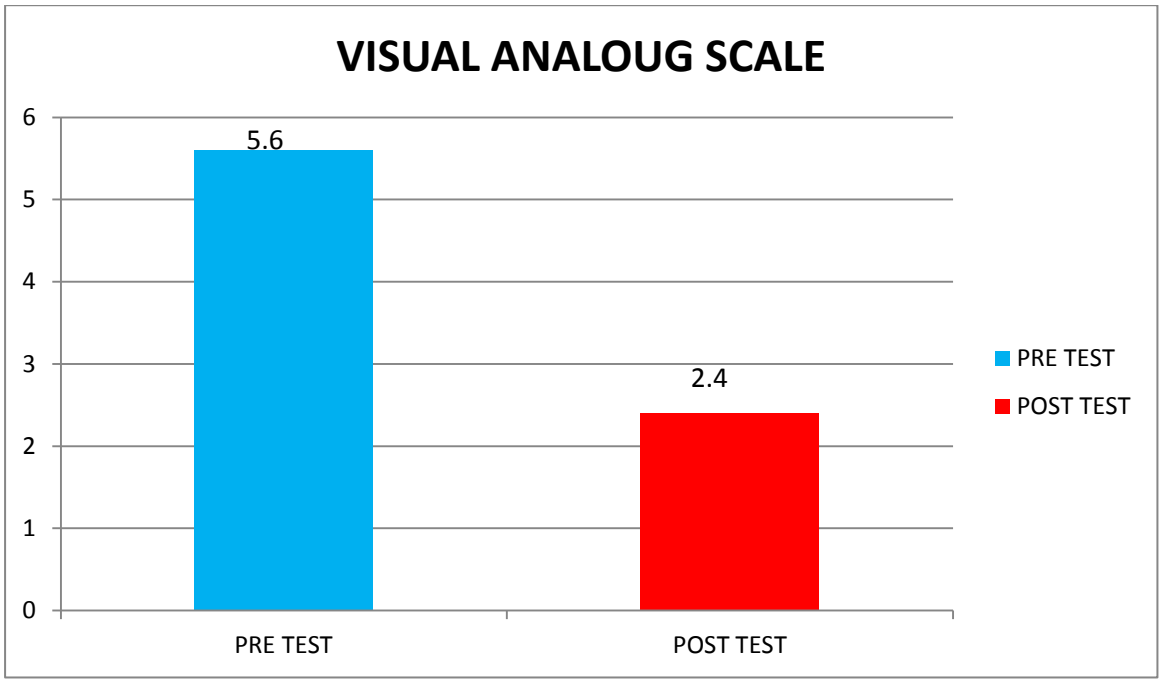


4.2.2.2 UPPER EXTRIMITY FUNCTIONAL INDEX

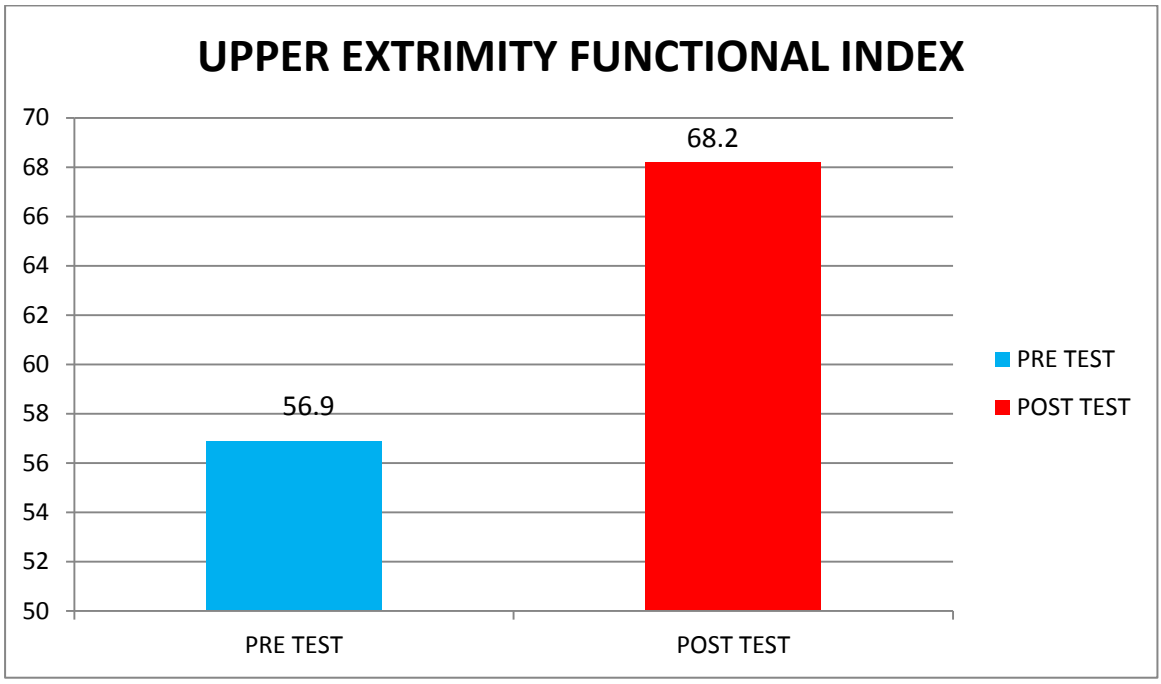


4.2.3. PAIRED 'T' TEST - CONVENTIONAL GROUP

4.2.3.1. VISUAL ANALOUG SCALE

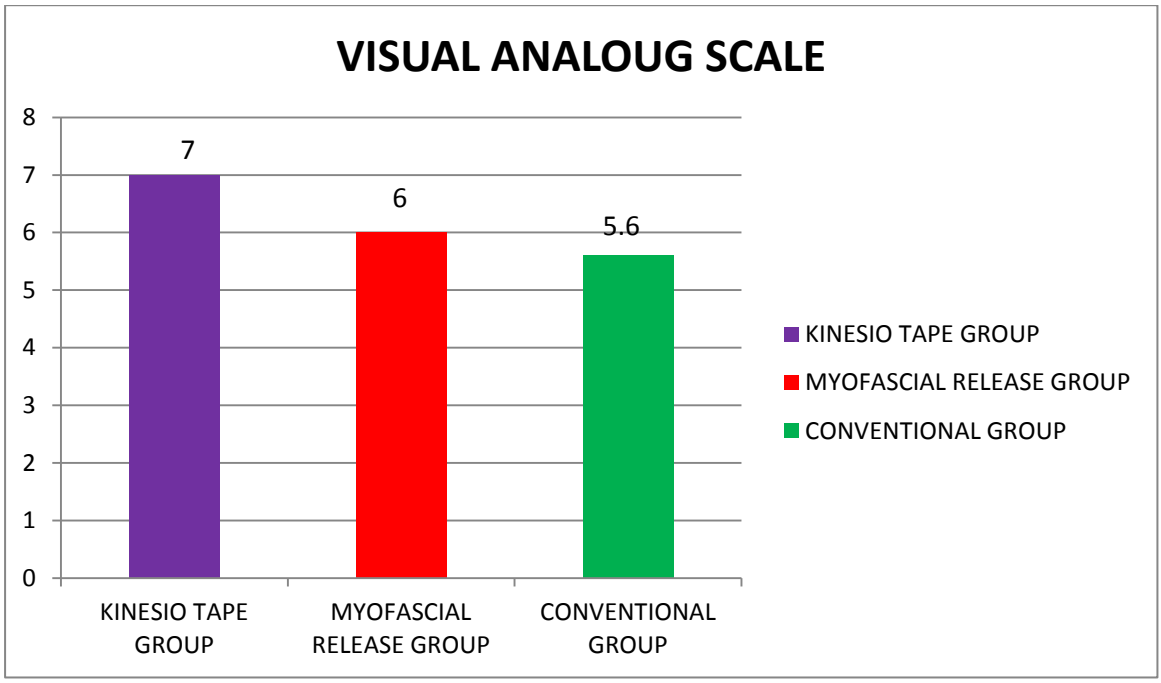


4.2.3.2 UPPER EXTRIMITY FUNCTIONAL INDEX QUESTIONNAIRE

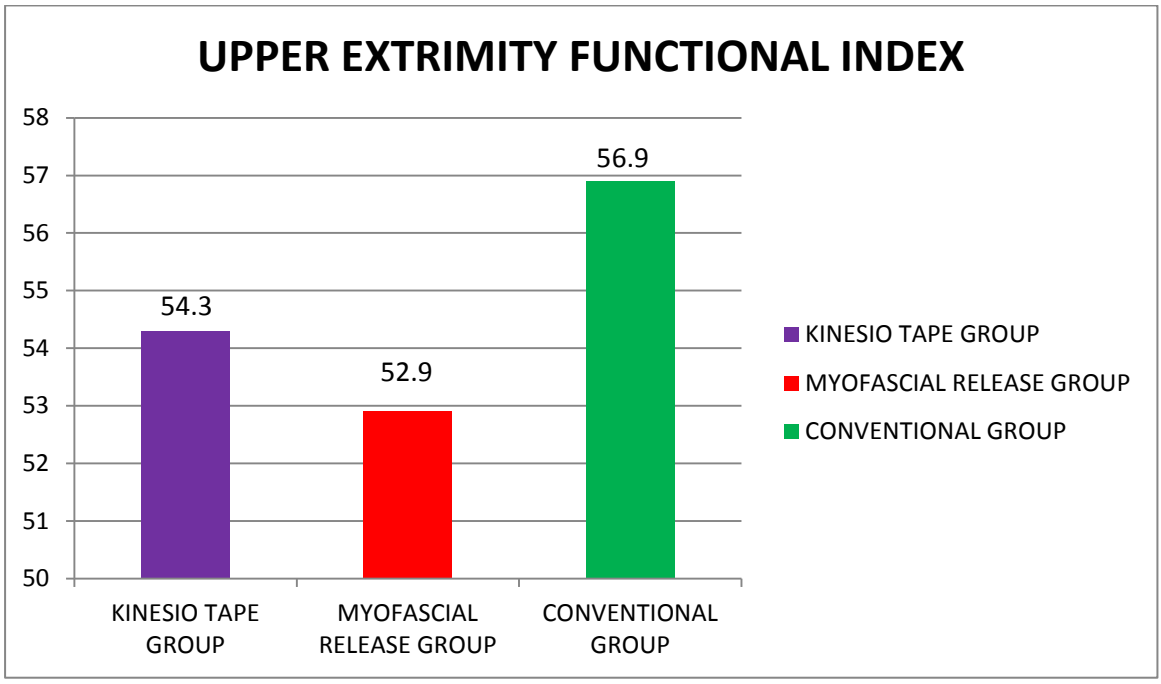


4.2.4 ONE WAY ANOVA - PRE TEST

4.2.4.1. VISUAL ANALOUG SCALE

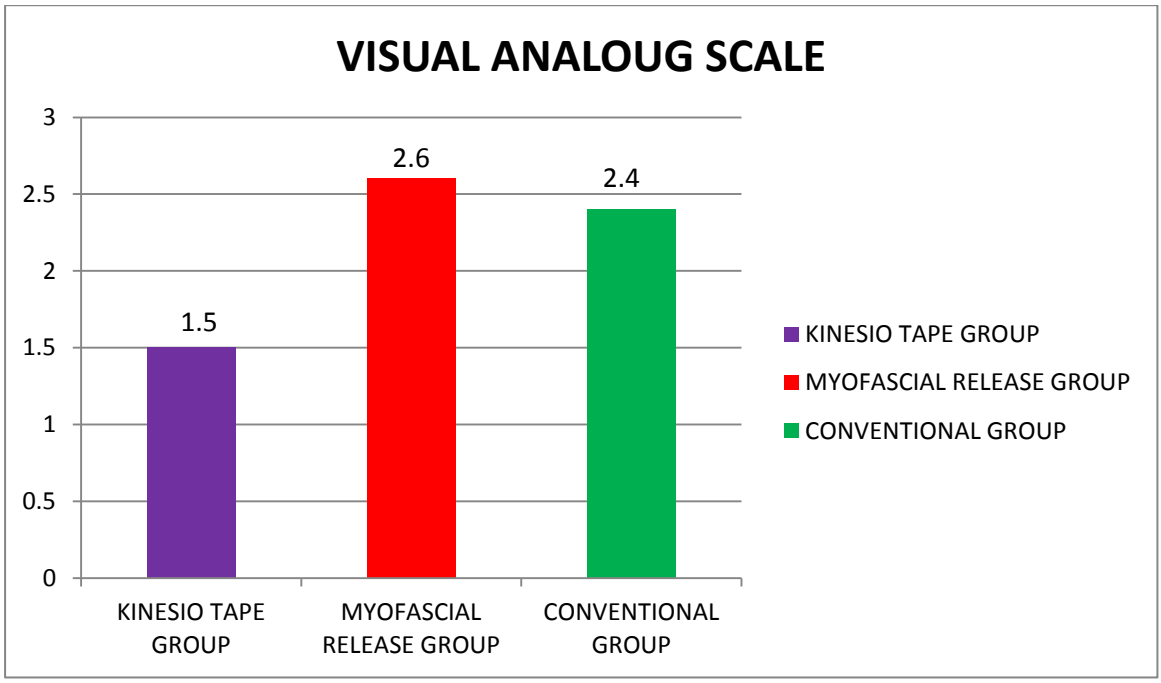


4.2.4.2 UPPER EXTRIMITY FUNCTIONAL INDEX QUESTIONNAIRE

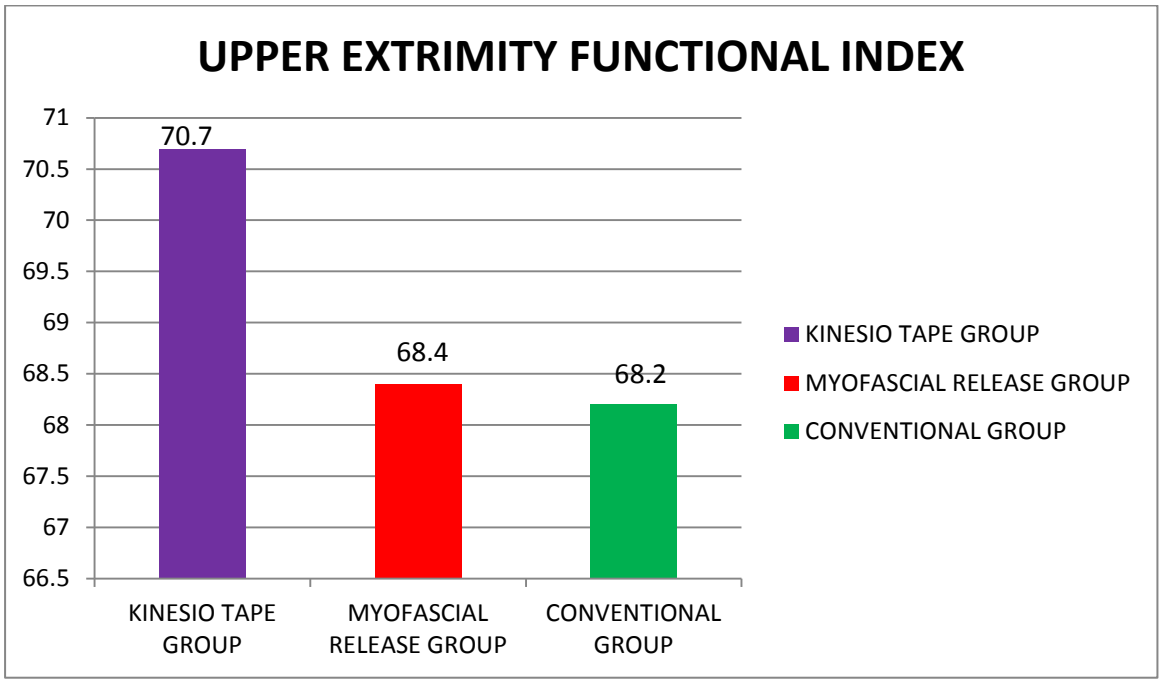


4.2.5 ONE WAY ANOVA - POST TEST

4.2.5.1. VISUAL ANALOUG SCALE



4.2.5.2 UPPER EXTRIMITY FUNCTIONAL INDEX QUESTIONNAIRE



5. DATA ANALYSIS AND RESULTS

PAIRED "T" TEST : VISUAL ANALOUG SCALE

GROUP- A (KINESIO TAPE GROUP)

The pre test and post test values of visual analouge scale using paired 't' test. For 9 degree of freedom at 5% level of significance the table 't' value was 2.262 and the calculated 't' value was 10.59. Since the calculated 't' value was greater than the table 't' value, alternative hypothesis was accepted. Hence there was significant improvement in Visual Analouge Scale in Kinesio Tape Group.

GROUP- B (MYOFASCIAL RELEASE GROUP)

The pre test and post test values of visual analouge scale using paired 't' test. For 9 degree of freedom at 5% level of significance the table 't' value was 2.262 and the calculated 't' value was 12.79. Since the calculated 't' value was greater than the table 't' value, alternative hypothesis was accepted. Hence there was significant improvement in Visual Analouge Scale in Myofascial Release Group.

GROUP- C (CONVENTIONAL GROUP)

The pre test and post test values of visual analouge scale using paired 't' test. For 9 degree of freedom at 5% level of significance the table 't' value was 2.262 and the calculated 't' value was7.71. Since the calculated 't' value was greater than the table 't' value, alternative hypothesis was accepted. Hence there was significant improvement in Visual Analouge Scale in Conventional Group.

PAIRED "T" TEST: UPPER EXTRIMITY FUNCTIONAL INDEX SCALE

GROUP- A (KINESIO TAPE GROUP)

The pre test and post test values of upper extrimity functional index Scale using paired 't' test. For 9 degree of freedom at 5% level of significance the table 't' value was 2.262 and the calculated 't' value was 31.59. Since the calculated 't' value

was greater than the table ‘t’ value, alternative hypothesis was accepted. Hence there was significant improvement in Upper Extrimity Functional Index Scale in Kinesio Tape Group.

GROUP- B (MYOFASCIAL RELEASE GROUP)

The pre test and post test values of upper extrimity functional index scale using paired ‘t’ test. For 9 degree of freedom at 5% level of significance the table ‘t’ value was 2.262 and the calculated ‘t’ value was 4.34. Since the calculated ‘t’ value was greater than the table ‘t’ value, alternative hypothesis was accepted. Hence there was significant improvement in of Upper Extrimity Functional Index Scale in Myofascial Release Group.

GROUP- C (CONVENTIONAL GROUP)

The pre test and post test values of upper extrimity functional index scale using paired ‘t’ test. For 9 degree of freedom at 5% level of significance the table ‘t’ value was 2.262 and the calculated ‘t’ value was 11.3. Since the calculated ‘t’ value was greater than the table ‘t’ value, alternative hypothesis was accepted. Hence there was significant improvement in of Upper Extrimity Functional Index Scale in Conventional Group.

ONE WAY ANOVA :

VISUAL ANALOUGE SCALE (PRE)

Pre test for experimental 1, experimental 2 groups and control group were analysed using One way ANOVA test. The calculated value was 2.18. For 27 degree of freedom at 5% level of significance the table value is 3.35. Since the calculated value is lesser than the table value, there is no significant difference between pre Test scores of experimental 1, experimental 2 and control group. Hence null hypothesis is accepted.

UPPER EXTRIMITY FUNCTIONAL INDEX (PRE)

Pre test for experimental 1, experimental 2 groups and control group were analysed using One way ANOVA test. The calculated value was 1.06. For 27 degree of freedom at 5% level of significance the table value is 3.35. Since the calculated

value is lesser than the table value, there is no significant difference between pre test scores of experimental 1, experimental 2 and control group. Hence null hypothesis is accepted.

VISUAL ANALOUGE SCALE (POST)

Post test for experimental 1, experimental 2 groups and control group were analysed using One way ANOVA test. The calculated value was 4.39. For 27 degree of freedom at 5% level of significance the table value is 3.35. Since the calculated value is greater than the table value, there is significant difference between post test scores of experimental 1, experimental 2 and control group. Hence alternative hypothesis is accepted.

UPPER EXTRIMITY FUNCTIONAL INDEX (POST)

Post test for experimental 1, experimental 2 groups and control group were analysed using One way ANOVA test. The calculated value was 19.37. For 27 degree of freedom at 5% level of significance the table value is 3.35. Since the calculated value is greater than the table value, there is significant difference between post test scores of experimental 1, experimental 2 and control group. Hence null hypothesis is accepted.

6. DISCUSSION

Myofascial pain occurs due to trigger points in upper fiber of trapezius muscle is one of the most commonly encountered musculoskeletal disorders seen by the orthopaedic physical therapists. Myofascial pain syndromes commonly used physical therapy modalities include, ultrasound, cryostretching, moist heat therapy and techniques include manual therapy techniques like trigger point release techniques, positional release techniques, myofascial release techniques , kinesio tape, dry needling etc.

In this study patients with trigger points over upper trapezius are randomly selected and allocated to three treatment groups. Subjects in Group- A (Kinesio Tape Technique) were treated and Group- B (Myofascial Release) were treated and Group- C (Conventional Therapy) were treated with home exercise and stretching.

At the end of the 4^{th} week treatment of the post test values were pointed out from the subjects in all groups using visual analouge scale and upper extrimity functional index questionnaire. The analysis of results showed all treatment technique are effective in the treatment of trigger points, but while comparing all groups subject in group- A who received kinesio tape technique showed more reduction in pain that group- B and group- C who received myofascial release and conventional therapy.

The previous study conducted on effect of kinesio tape technique along or across a muscle on motor neuron excitability by using triceps surae. The results from this study concluded that by applying a kinesio tape, which will reduce the afferent discharge from the neuromuscular spindle, that reduce the motor neurons in anterior horn, supports our results.

Another study based on the treatment of myofascial pain in shoulder with Kinesio Tape, concluded that the treatment with Kinesio taping contributed to the immediate reduction of patients pathology hence it is an effective and highly appropriate technique for treatment of trigger points.

Short term effects of cervical Kinesio Tape on pain in patient with acute whiplash injury a randomized controled trial was carried out. Examiner blinded 24 hrs immediate follow up after Kinesio Tape application indicated that these patient experienced a greater decrease in pain.

The results from the above provided literature reviews support the concluded result of our present study which shows the effectiveness of Kinesio Tape in reducing pain caused by the trigger points in upper trapezius muscle.

Myofascial Release which was an effective treatment for relieving trigger points in upper trapezius. The technique used in this study was the same suggested in case of somatic dysfunction. In this technique repeat the stretch sequence until a final end feel was reached.

The result from comparing the result of the effectiveness of Kinesio Tape technique verses myofascial release technique verses conventional technique in Upper trapezius trigger points shows kinesio tape technique is more effective in reducing pain than myofascial release and conventional in upper trapezius trigger points.

7. SUMMARY AND CONCLUSION

A comparative study was conducted to investigate the difference between "Effects of Kinesio Taping, Myofascial Release and Conventional Therapy on Pain and upper extrimity functional index in Myofascial Pain Syndrome on Upper Trapezius."

45 patients with Myofascial trigger point in Upper Trapezius were included in the study and randomly divided into 3 groups. group – A and group- B and group – C each group containing 15 subjects. Subjects in group- A were treated with Kinesio Tape technique and group- B were treated with Myofascial Release and group- C were treated with conventional technique for a period of 4 weeks. Pre and post pain assessments were done using the Visual Analouge Scale and Upper Extrimity Functional Index questionnaire respectively.

It was found that Kinesio Tape technique was found more effective than Myofascial Release and Conventional Technique when used in reducing pain in upper trapezius trigger points. Statistical results done under paire "t" showed significant improvement in all groups i.e. the group- A and group- B and group- C. When groups are compared with ONE WAY ANOVA there was no statistical significance (Calculated "t" value is less than table value) , but group- A showed more significance than group – B and group- C.

8. LIMITATIONS AND SUGGESTIONS

Limitations

- Sample size was small.
- Study duration was short.

Suggestions

- This study can be done in more samples and duration of study can be increased.
- Follow up assessment is needed to find the effectiveness of pain and functional outcomes.
- Studies can be done to find out effectiveness of Kinesio Tape Technique, Myofascial Release technique, and conventional Technique is trigger points separately.
- Can be done on other group of muscles.